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PROCESS FOR PRODUCING A COVERING PROTECTED AGAINST THE INTRUSION OF MOISTURE

(57) Abstract:

For the production of a covering for floors, walls, partitions, etc., which is protected against the intrusion of moisture, at least the edges (4) of prefabricated plates, tiles, or similar units (1) are provided with a plastic coating (5), and the coating is aged to allow it to cure. After the plates or the like have been laid on a load-bearing substrate (2) by way of an adhesive layer (3), the unfilled joints are grouted with a plastic material (7) of such a nature that a tight bond is formed between this material and the adjacent plastic coating (5) on the plates, etc. At least the top surface of the plate, etc., can be provided with a layer of plastic containing at least one additive, which serves to colorize the plate or to create some other type of visual effect.

The following information has been taken from documents submitted by the applicant.

Specification

The invention pertains to a process according to the introductory clause of Claim 1.

It is known that the damaged floors of balconies and terraces can be made weather-resistant again by coating them with a plastic material which spans the cracks. This applies both to concrete and composition floors and also to floors made of ceramic elements such as tiles or plates. The treatment consists in applying a coating over the entire surface of the floor covering. As also in other cases, these are follow-up measures which are applied to previously installed coverings to seal them. The basic appearance of the covering is not changed in these cases, especially when the coating in question is clear or tinted.

In the case of floor coverings consisting of tiles or similar individual ceramic elements, the joints between the tiles are the critical points where leakage can occur. A conventional grout develops its own cracks of varying degrees of fineness over the course of time, and small gaps also develop between the grout and the tile. It thus becomes possible for water to penetrate. Instead of a cementitious mortar, etc., plastic can also be used to grout the joints of a ceramic floor covering. As a result, it is possible to avoid cracks in the grout material itself, at least for the most part. The seams between the grout material and the ceramic tiles, however, remain a problem.

The task of the invention is to overcome the existing disadvantages and inadequacies and to create a covering for floors, walls, partitions, etc., formed out of plates, tiles, or similar units which, while preserving the characteristic appearance of a covering of this type, is completely or at least almost completely impermeable to water or moisture. The invention intends to provide an advantageous process for producing an impermeable covering out of individual units, a process which can satisfy various sets of requirements and which can be adapted to various situations, especially with respect to the achievement of visual effects. Other associated problems with which the invention deals can be derived from the explanations provided for the various solutions.

In the process according to the invention, at least the edges of the prefabricated plates are provided with a plastic coating, which is then aged to allow it to cure or to dry. After the plates have been laid on the load-bearing substrate, the joints which have been left are grouted with a plastic material of such a nature that a tight bond is created between this material and the adjacent plastic coating on the plate. The plastic material introduced into the joints does not come into direct contact with the material of the plates in this case; instead, it comes into contact with the previously applied plastic, which is already adhering tightly to the plate. As a result, what is obtained is a plastic/plastic bond, which provides a leak-proof continuum. The term "plate" used here is to be understood to include any of the various types of units or elements with which floors, walls, and other flat or curved structures or structural components can be covered or lined. In addition to ceramic elements such as tiles, etc., the idea of a plate thus also includes boards made of hard fiber or mineral fiber, etc. These plates can also be facing tiles, roof covering elements, and similar items.

Various plastics can be used to produce the coating on at least the edges of the plates and to grout the joints between them as long as they can be processed in the manner indicated and provided that they form a tight bond with each other, whether by physical or chemical effects or by both types of effects. The plastic used to coat the surfaces of the plates and the plastic used to grout the joints preferably have the same or comparable properties. It is advisable to use a so-called "engineering resin" with high compressive and bending strength and good adhesion properties as the plastic coating material and/or as the grouting material. This can be in particular an epoxy resin or a polyurethane resin, although other one-component or two-component plastics are not excluded.

The plastic coating on the edges of the plates can contain a certain amount of quartz material or can be provided with such material after it has been applied.

A plastic coating can be applied exclusively to the edges of the plates which form the joints with the adjacent plates. The coating can also cover only part of the edge in question. In another embodiment of the invention, the plates are provided with a plastic coating on all sides. This can be done in particular by dipping the plates into the plastic in question.

In cases where the bottom surface of the plate is also given a plastic coating, it is advisable to provide granulate or a similar granular material on this bottom surface before the coating has solidified, so that the particles stand out from the coating after the coating has cured. This is advantageous, for example, when the plates are to be attached to the substrate by means of an adhesive. One possibility is to press the plates which have been coated into a bed of granulate, quartz sand, etc., so that the plate will pick up the granular material. In principle, granular material of the type indicated can also be applied to the edges.

In another embodiment of the invention, a layer of plastic can be provided at least on the top surface of the plate, this layer containing at least one additive serving to colorize the plate or to create some other type of visual effect. A layer of this type can be provided on a plate which does not have a plastic coating on the top surface, or it can be provided in addition to the plastic coating already present on the top surface. Before this layer has solidified, at least one additive can be incorporated into it. This can be of various types and forms, such as a color pigment or individual monochromatic or multi-colored particles, etc. The additive can be scattered onto the coating. The additive can also be applied to the plates in the form of a mixture with the plastic layer. Any number of different effects can be achieved as a function of the requirements in the individual case.

The plastic material serving to grout the joints can also contain at least one additive which colorizes the plastic or produces some other type of visual effect. Instead of or in addition to that, it can have a granular material such as quartz sand, granulate, etc. The joints can be grouted by, for example, pouring or spraying the plastic material into them.

Regardless of the details of the implementation, the plates can be provided at least on their top surfaces, and possibly also on their edges, with a UV-resistant coating or protective layer. This option is of particular interest in cases where the top surface of the plates already has a plastic coating of the type explained above and/or a plastic layer with a visual effect.

In addition to the process explained above and the covering thus produced, the object of the invention also includes a plate-shaped element which is designed or prepared or adapted for use in the process and thus in particular an element with edges which have been provided with a cured or solidified plastic coating of the type explained above. Such prefabricated elements such as tiles, mineral fiber boards, or similar units can then be brought to the work site and laid in place there by the method according to the invention, whether this be on horizontal, vertical, slanted, or curved surfaces.

Additional details, features, and advantages of the invention can be derived from the following explanation of exemplary embodiments, from the associated drawing, and from the claims:

- Figure 1 shows a partially schematic, perspective view of a floor covering made of plates laid on a load-bearing substrate;
- Figure 2 shows a cross section along line II-II of Figure 1;
- Figure 3 shows a perspective view of part of a tile;
- Figure 4 shows a modified design in the form of a cross section corresponding to that of Figure 2 of; and
- Figures 5-12 show schematic diagrams of the individual steps involved in executing the process.

Figures 1 and 2 show a floor covering, for which individual tiles 1 of ceramic material or similar plate-shaped elements are laid by way of an adhesive layer 3 on a load-bearing substrate 2 such as a poured concrete or composition floor. The edges 4 of the tiles 1 are provided with a cured or dried plastic coating 5, which can consist of a so-called engineering resin such as an epoxy resin. The joints 6 left between the tiles after they have been laid have been grouted by, for example, pouring a plastic material 7 into them, which material, such as a suitable engineering resin, preferably is the same as the material of the plastic coating 5 or has properties similar to those of that material. The grouting material can also contain additives which promote the bonding of the grout to the coating on the tile and/or which serve to produce a visual effect.

Figure 3 shows a tile or a ceramic plate 1 on a larger scale. Here the upper boundaries of the edges are not sharply defined, although this would be entirely possible; instead, they are designed as rounded edges 8. If this rounding is supposed to be visible after the covering has been completed, the edges 4 of the tile 1 are provided with the plastic coating 5 only up to the point at which the rounding starts, that is, only up to a certain height H.

The top surface of the tiles 1 or other plate-shaped elements can be left in the state originally present when the tile was produced. It is also possible, however, and also desirable in many cases, to treat or to process the elements additionally for the purpose in particular of achieving special visual effects. The invention also offers advantageous opportunities in this respect in conjunction with the achievement of a leak-proof covering.

Figure 4, for example, shows a cross section, corresponding to that of Figure 2, of a floor covering, in which again individual tiles 11 or similar plate-shaped elements are laid by way of an adhesive layer 3 on a load-bearing substrate 2. In this design, the tiles or plates 11 are provided with a cured or dried plastic coating 15 not only on their edges but also on all the other surfaces, as can be seen in Figure 4. What was said above in conjunction with Figures 1 and 2 concerning the type of plastic and what was said in the preceding section of the specification also apply here in a corresponding manner.

In this embodiment, furthermore, the plates 11 are provided with an additional layer of plastic 12 on the top surface in combination with the plastic coating 15. This additional layer serves to provide color or to achieve a particular visual effect. The plastic used for this layer can in particular be the same as or similar to that which forms the coating 15. It can already contain an additive suitable for producing the desired effect before it is applied. It is also possible in particular, however, to introduce, i.e., to scatter, the additive onto the layer after the layer has been applied but before it has solidified (cured, dried),.

In the embodiment according to Figure 4, the plates 11 are provided with a final protective layer 13 known in and of itself at least on the top surface, this final layer serving to protect the layers underneath from the harmful effects of UV radiation. This protective layer 13 can also contain additives if desired.

The embodiment explained in conjunction with Figure 4 makes it possible to use unfinished plates or the like, which are given their final appearance by the coating or by one or more surface layers.

The joints 6 left between the plates 11 as they are being laid have been grouted here, too, with a plastic material 7, which is suitable for forming a tight bond with the material of the plastic coating 15.

Figures 5-12 help to explain how plates 11 can be treated to produce a covering of the type shown in Figure 4. The individual steps can be carried out by hand or by suitable machines.

An unfinished plate 11 or a plate in some other type of as-delivered state, etc., is dipped by means of tongs (not shown), for example, into a bath 21 of a plastic, such as an epoxy engineering resin, of suitable consistency (Figure 5) and thus provided with a coating 15. The plate 11 is then placed on a nail board 22 (Figure 7) so that the coating 15 can cure.

Before the plate is set out to cure, its bottom surface can be pressed into a bed 23 of granulate (clay, etc.), quartz sand, or similar material (Figure 6), so that particles of this material are incorporated into the coating 15 in such a way that, after the coating 15 has cured, the particles stand out slightly from it. This can be advantageous later when the plates are laid into an adhesive.

In this exemplary embodiment, a layer of plastic 12 is applied over the top surface of the plastic coating 15; this layer 12 can be applied by rolling or possibly by spraying. In Figure

8, an application process of this type is indicated merely in schematic fashion in the area designated by the number 16. Material particles 17 are scattered (Figure 9) into the still fresh, uncured coating 12 to achieve a special visual effect. These can be colored particles, for example, or granulate (stone chips) or particles of glass, quartz, plastic, metal (chips), etc. After the coating has cured (Figure 10), the particles are permanently embedded in it. Instead of scattering particles over a previously applied layer of plastic, it is also possible to apply a mixture which already contains particles of the desired type such as color pigments, etc.

Figure 11 shows schematically the application, designated by the number 18, of a final UV-resistant coating or protective layer, which consists, for example, of a clear synthetic resin and which is cured after it has been applied (Figure 12).

All of the features mentioned in the preceding specification and illustrated in the drawing are intended to fall within the scope of the invention either alone or in combinations insofar as the known state of the art allows.

Claims

1. Process for producing a covering for floors, walls, partitions, etc., which is protected against the intrusion of moisture, according to which process plates, tiles, or similar units are laid on a load-bearing substrate and where a plastic material is used, characterized by the following steps:

(a) at least the edges of the prefabricated plates are provided with a plastic coating, and the coating is aged until its cures;

(b) after the plates have been laid on the load-bearing substrate, the joints which have been left are grouted with a plastic material of such a kind that a tight bond is created between this grouting material and the adjacent plastic coating on the plates.

2. Process according to Claim 1, characterized in that plastics with the same or comparable properties are used to produce the plastic coating on the plate surfaces and to grout the joints.

3. Process according to Claim 1 or Claim 2, characterized in that a so-called engineering resin with high compressive and bending strength and good adhesive properties is used to produce the plastic coating on the plate surfaces and/or to grout the joints.

4. Process according to one of Claims 1-3, characterized in that an epoxy resin or a polyurethane resin is used to produce the plastic coating on the plate surfaces and/or to grout the joints.

5. Process according to one of Claims 1-4, characterized in that the plastic coating on the edges of the plates contains a certain amount of quartz material or is provided with such material after the coating has been applied.

6. Process according to one of Claims 1-5, characterized in that the plates are dipped to provide them with a plastic coating on all sides.

7. Process according to one of Claims 1-6, characterized in that, in cases where the plates have also been provided with a plastic coating on the bottom surface, granulate or similar granular material is applied to this bottom surface before the plastic coating has solidified so that the particles stand out from the coating after it has solidified.

8. Process according to Claim 7, characterized in that the plates which have been provided with the coating are pressed into a bed of granulate, etc., to pick up the granular material.

9. Process according to one of Claims 1-8, characterized in that at least the top surface of the plates is provided with a layer of plastic which contains at least one additive serving to colorize the plate or to achieve some other type of visual effect.

10. Process according to Claim 9, characterized in that the layer of plastic is provided in addition to the plastic coating.

11. Process according to Claim 9 or Claim 10, characterized in that at least one additive is introduced into the plastic layer before the layer solidifies.

12. Process according to Claim 11, characterized in that the additive is scattered onto the layer.

13. Process according to Claim 11, characterized in that the layer of plastic and the additive are applied to the plates together in the form of a mixture.

14. Process according to one of Claims 1-13, characterized in that the plastic material used to grout the joints contains at least one additive serving to provide color or to achieve some other type of visual effect.

15. Process according to one of Claims 1-14, characterized in that at least the top surface of the plates is provided with a UV-resistant coating or protective layer.

16. Plate-shaped element such as a tile, fiberboard panel, etc., suitable for the production of a covering for floors, walls, partitions, etc., characterized in that it is designed to be used in the process according to one of Claims 1-15.

17. Element according to Claim 16, characterized in that at least the edges (4) of the element (1, 11) are provided with a solid plastic coating (5).

Two pages of drawings attached.